REMARKS

This application has been carefully reviewed in light of the Office Action dated January 10, 2008. Claims 1, 3-14 and 16-20, 22, 24 and 25 remain in this application. Claims 1, 12-14, 20, 24 and 25 are the independent Claims. Claims 1, 7, 12-14, 20, and 25 have been amended. Claims 2, 15, 21, and 23 have been canceled without prejudice. It is believed that no new matter is involved in the amendments or arguments presented herein. Reconsideration and entrance of the amendment in the application are respectfully requested.

Double Patenting Rejections

On page 4 and 5 of the Office Action, Claims 1-25 were provisionally rejected under non-statutory obviousness-type double patenting over Claims 1-21 of copending Application No. 10/537,959. In response, Applicant submits herewith a terminal disclaimer linking the term of the instant application to the term of copending Application No. 10/537,959.

Reconsideration and withdrawal of the above double-patenting rejections are respectfully requested.

Claim Objection

Claim 21 was objected to because of an informality. In response, Claim 21 is canceled, rendering the objection moot. Reconsideration and withdrawal of the above objection are respectfully requested.

Non-Art Based Rejections

Claim 25 was rejected under 35 U.S.C. § 112, second paragraph, for insufficient antecedent basis. In response, Applicant has amended that claim to

address the concern expressed in the Office Action. Reconsideration and withdrawal of the above § 112 rejections are respectfully requested.

Art-Based Rejections

Claims 1-9, 13-19, and 23 were rejected under 35 U.S.C. § 102(a) or (e) over U.S. Patent No. 6,613,987 (Seki); Claims 1-25 were rejected under 35 U.S.C. § 102(a), (b), or (e) over U.S. Patent No. 6,824,827 (Katsuki). Applicant respectfully traverses the rejections and submits that the claims herein are patentable in light of the clarifying amendments above and the arguments below.

The Seki Reference

Seki is directed to alternating lamination of an insulating layer on a conductor layer and a plasma treatment on the surface of an insulating layer *(See Seki; Abstract and Col. 3, lines 56-59).*

The Katsuki Reference

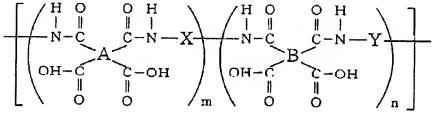
Katsuki is directed to surface treating a polyimide film having biphenyltetracarboxylic acid component. A surface treating method including a plasma treatment and permanganate treatment *(See Katsuki; Col. 3, lines 1-9 and Abstract).*

The Claims are Patentable Over the Cited References

The present application is generally directed to a laminate forming a copper metal layer on a polymeric film which has a smooth plane.

Claim 1

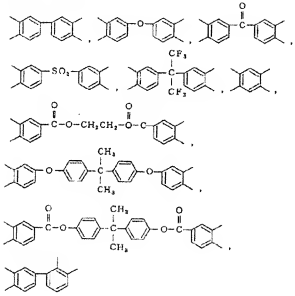
As defined by amended independent Claim 1, a laminate comprising a thermoplastic layer, and a metal layer on a surface of the thermoplastic polyimide layer. The thermoplastic polyimide layer is surface-treated by at least one treatment selected from the group consisting of a plasma treatment, a corona treatment, a coupling agent treatment, a permanganate treatment, a ultraviolet ray emitting treatment, an electron beam emitting treatment, surface treatment by colliding an abrasive at a high speed, a firing treatment, and a hydrophilization treatment. The thermoplastic polyimide layer comprises a thermoplastic polyimide which is obtained by dehydration and ring-closing a polyamic acid represented by the following general formula (1);



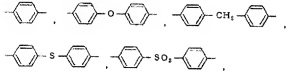
(1)

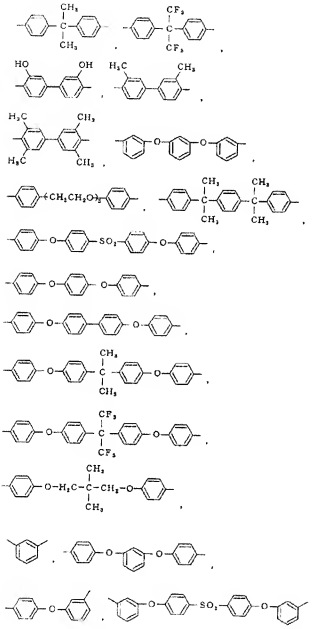
A is a quadrivalent organic group selected from the following formula (2), and may be the same or different; X is a divalent organic group selected from the following formula (3), and may be the same or different; B is a quadrivalent organic group other than those represented by the formula (2), and may be the same or different; Y is a divalent organic group other than those represented by the formula (3), and may be the same or different; m : n is 100 : 0).

Formula (2)



Formula (3)





The applied references do not disclose or suggest the features of the present invention as defined by amended independent Claim 1. In particular, the applied references do not disclose or suggest, "The thermoplastic polyimide layer comprises

a thermoplastic polyimide which is obtained by dehydration and ring-closing a polyamic acid represented by the following general formula (1); ... A is a quadrivalent organic group selected from the following formula (2), and may be the same or different; X is a divalent organic group selected from the following formula (3), and may be the same or different; B is a quadrivalent organic group other than those represented by the formula (2), and may be the same or different; Y is a divalent organic group other than those represented by the formula (3), and may be the same or different; m : n is 100 : 0)," as required by amended independent Claim 1.

Seki is directed to alternating lamination of an insulating layer and a conductor layer *(See Seki; Abstract).* The resin composition of Seki is disclosed in column 5, lines 24 to column 6, lines 36. However, the structures recited in applicant's amended independent claim 1 are not disclosed. Katsuki is similarly deficient.

Applicant notes that the biphenyl structures of Formula (2) of originally presented claim 21 are not recited in amended independent Claim 1. However, Katsuki is merely directed to surface treating a polyimide film having a biphenyltetracarboxylic acid component *(See Katsuki; Abstract).* Thus, Katsuki does not remedy the deficiencies of Seki in this regard.

In contrast, the present invention requires the thermoplastic polyimide to be represented by the formulas (1)-(3), which are amended to not include the first and last biphenyl structures originally presented in Formula 2 of Claim 21. This feature provides improved adhesion between the metal layer and the polyimide film *(See Specification; Page 36, line 18 – Page 37, line 1).*

Thus, the cited references do not disclose or suggest this feature of the present invention as required by amended independent Claim 1.

Since the applied references fail to disclose, teach or suggest the above features recited in amended independent Claim 1, those references cannot be said to anticipate nor render obvious the invention which is the subject matter of that claim.

Accordingly, amended independent Claim 1 is believed to be in condition for allowance and such allowance is respectfully requested.

Applicant respectfully submits that amended independent Claims 12-14, and 20 are allowable for at least the same reasons as discussed above with reference to amended independent Claim 1 and such allowance is respectfully requested.

Claims 24 and 25

As defined by independent claim 24, a printed circuit board is prepared by forming a thermoplastic polyimide resin layer on one face of a non-thermoplastic polyimide film. An adhesive layer is formed on the other face of the non-thermoplastic polyimide film. The adhesive layer and a circuit face of a circuit-formed circuit board is opposed to each other to laminate in accordance with a method using heating and/or pressurization. Panel plating is carried out in accordance with a physical vapor deposition method on a thermoplastic polyimide surface after laminating.

The applied references do not disclose or suggest the features of the present invention as defined by independent Claim 24. In particular, the applied references do not disclose or suggest, "forming an adhesive layer on the other face of the non-thermoplastic polyimide film," as required by independent Claim 24.

As defined by amended independent Claim 25, a printed circuit board is prepared by forming a thermoplastic polyimide resin layer on one face of a non-

thermoplastic polyimide film. An other face of the non-thermoplastic polyimide film is laminated on a circuit-formed circuit board via an adhesive sheet in accordance with a method using heating and/or pressurization. Panel plating is carried out in accordance with a physical vapor deposition method on a thermoplastic polyimide layer surface after laminating.

The applied references do not disclose or suggest the features of the present invention as defined by amended independent Claim 25. In particular, the applied references do not disclose or suggest, "laminating an other face of the non-thermoplastic polyimide film on a circuit-formed circuit board via an adhesive sheet in accordance with a method using heating and/or pressurization," as required by amended independent Claim 25.

Seki fails to disclose or suggest an adhesive layer on the other face of a non-thermoplastic polyimide layer. Katsuki merely teaches a multilayer polyimide film prepared by a coextrusion casting method and does not remedy the deficiencies of Seki in this regard. In contrast, the present invention requires an adhesive layer on the other face of the non-thermoplastic polyimide film or an adhesive sheet laminated on an other face of a non-thermoplastic polyimide film. In this manner, the present invention provides a printed circuit board having excellent adhesion stability, reliability, and a process resistance property such as de-smearing resistance or the like *(See Specification; Page 111, lines 2-9).*

Thus, the cited references do not disclose or suggest this feature of the present invention as required by independent Claims 24 and 25.

Since the applied references fail to disclose, teach or suggest the above features recited in independent Claims 24 and 25, these references cannot be said to

anticipate nor render obvious the invention which is the subject matter of those claims.

Accordingly, independent Claims 24 and 25 are believed to be in condition for allowance and such allowance is respectfully requested.

The remaining claims depend either directly or indirectly from amended independent Claims 1, 12-14, 20, 24 and 25, and recite additional features of the invention which are neither disclosed nor fairly suggested by the applied references and are therefore also believed to be in condition for allowance.

For example, with respect to dependent Claims 5, 6, 18, and 19, it is noted that those claims require that the metal layer be formed by depositing a metal element while heating the thermoplastic polyimide layer. This feature improves the adhesion between the metal layer and polyimide *(See Specification; Page 35, line 27 – Page 36, line 17)*. However, Seki merely teaches heat curing in the preparation of the insulating resin composition and not during the depositing of the metal layer *(See Seki; Examples 1-3)*. Similarly, Katsuki teaches a thin metal layer formed on the polyimide film without disclosure or suggestion of heating while depositing the metal layer on the film. The polyimide film is preheated only before the metal layer is deposited *(See Katsuki; Col. 7, lines 34-47 and Examples 1-3)*. Therefore, heating the thermoplastic polyimide layer while depositing the metal layer is nowhere taught or suggested by the cited references, and further distinguishes the present application over Seki and Katsuki.

Conclusion

In view of the foregoing, it is respectfully submitted that the application is in condition for allowance. Reexamination and reconsideration of the application, as amended, are requested.

If for any reason the Examiner finds the application other than in condition for allowance, the Examiner is requested to call the undersigned attorney at the Los Angeles, California telephone number (310) 785-4721 to discuss the steps necessary for placing the application in condition for allowance.

If there are any fees due in connection with the filing of this response, please charge the fees to our Deposit Account No. 50-1314.

Respectfully submitted,
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